

Abstract of the Disclosure

A nanocomposite electrolyte membrane capable of suppressing cross-over of a polar organic fuel and a fuel cell using the nanocomposite electrolyte membrane are provided. The nanocomposite electrolyte membrane for a fuel cell includes a polymer having cation exchange groups and silicate nanoparticles dispersed in the polymer, the silicate nanoparticles having a layered structure, and the silicate nanoparticles being intercalated with the polymer, or layers of the silicate nanoparticles being exfoliated. The nanocomposite electrolyte membrane has an improved ability to suppress permeation of polar organic fuels, such as methanol, and appropriate ionic conductivity. In addition, a fuel cell with the nanocomposite electrolyte membrane can effectively prevent cross-over of methanol used as a fuel, thereby providing improved working efficiency and extended lifespan.